

Application Number 09/851,363
Amendment dated June 5, 2007
Responsive to Office Action mailed March 5, 2007

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REMARKS

This amendment is responsive to the Office Action dated March 5, 2007. Applicant has amended claims 1, 4, 6, 7, 11, 14, 15, 32, 33, 42, 47, 55, and 83. Claims 1-2, 4-33, 35-71, and 74-85 are pending.

Claim Rejection Under 35 U.S.C. § 112, first paragraph

In the Office Action, the Examiner rejected claims 1, 2, 4-33, 35-71, and 74-85 under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. Specifically, with respect to Applicant's claim 1, the Examiner stated, "The specification does not contain the 'removable interface cards' which stated [sic] in the independent claims."¹

Applicant respectfully traverses the rejection. To satisfy the written description requirement, a patent specification must describe the claimed invention in sufficient detail that one skilled in the art can reasonably conclude that the inventor had possession of the claimed invention.² This issue is usually phrased as whether the application has "adequate support" for the claimed invention. Claim limitations can be satisfied through express, implicit or even inherent disclosure.³

Moreover, a description as filed is presumed to be adequate, unless or until sufficient evidence or reasoning to the contrary has been presented by the Examiner to rebut the presumption.⁴ Moreover, the Examiner has the initial burden of presenting by a preponderance of evidence why a person skilled in the art would not recognize in an Appellant's disclosure a description of the invention defined by the claims.⁵ In rejecting a claim, the Examiner must set forth express findings of fact regarding the above analysis which support the lack of written description conclusion.

Applicant respectfully submits that the specification satisfies the written description requirement of 35 U.S.C. § 112, first paragraph with respect to claims 1, 2, 4-33, 35-71, and 74-

¹ Office Action page 1, dated March 5, 2007.

² See, e.g., *Moba, B.V. v. Diamond Automation, Inc.*, 325 F.3d 1306, 1319, 66 USPQ2d 1429, 1438 (Fed. Cir. 2003); *Vas-Cath, Inc. v. Mahurkar*, 935 F.2d at 1563, 19 USPQ2d at 1116.

³ See MPEP 2163 Guidelines for the Examination of Patent Applications Under the 35 U.S.C. 112, para. 1, "Written Description" Requirement, pg. 5.

⁴ See, e.g., *In re Marzocchi*, 439 F.2d 220, 224, 169 USPQ 367, 370 (CCPA 1971)

⁵ *Wertheim*, 541 F.2d at 263, 191 USPQ at 97.

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85. Support for claims 1, 2, 4-33, 35-71, and 74-85 as previously presented can be found in Applicant's specification.

Specifically, Applicant's claim 1 requires a plurality of removable interface cards. Removable interface cards are present in FIGS. 1-3 and 7 and are discussed in the corresponding description. A person having ordinary skill in the art would reasonably conclude that Applicant understood these interface cards to be removable. For example, Applicant's specification makes clear that one advantage of the described techniques may be that "router 706 can be serviced without removing interface cards 702."⁶ One skilled in the art would recognize that, though it may not be necessary to remove the interface cards, it would certainly not be impossible to do so, hence the interface cards are understandably removable. Although discussed primarily with respect to independent claim 1, independent claims 32 and 47 contain similar requirements of removable interface cards. Likewise, similar arguments can be made with respect to claims 32 and 47. Therefore, claims 1, 32, and 47, as well as the respective dependent claims, namely claims 2, 4, 33, and 48-62, satisfy the written description requirements of 35 U.S.C. § 112, first paragraph with respect to "removable interface cards," as the dependent claims inherit the limitations of the respective independent claims.

Applicant's claim 1 also requires a router module separate from the plurality of removable interface cards. With respect to this requirement, the Examiner argued that the specification does not "contain [a] limitation on the router module 'separate' from the plurality of removable interface cards."⁷ However, as one example, FIG. 7, clearly portrays a routing module separate from a plurality of interface cards. In accordance with Applicant's claim 1, a routing module comprises a packet forwarding engine and an interface card concentrator module. FIG. 7 shows a routing module (router 706) which is separate from interface cards 702, joined by a midplane 704. As stated in Applicant's specification, router 706 may be, for example, a router as portrayed in FIG. 2 (router 200).⁸

Router 200 of FIG. 2 comprises a packet forwarding engine, i.e. forwarding engine 224, and interface card concentrator module 205. Likewise, FIG. 2 clearly portrays router 200 as

⁶ Applicant's specification, page 11, line 28.

⁷ Office Action page 1, dated March 5, 2007.

⁸ See, e.g., Applicant's specification, page 11, lines 15-17.

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being separate from interface cards 206. That is, router 200 is connected to interface cards 206 via passive midplane 208. In other words, router 200 is separate from interface cards 206. Although discussed primarily with respect to independent claim 1, independent claims 16, 32, 47, 63, 71, 81-83, and 85 contain similar requirements of a router module separate from the plurality of interface cards. Therefore, claims 1, 16, 32, 47, 63, 71, 81-83, and 85, as well as the respective dependent claims, namely claims 2, 4, 33, 48-62, 64-70, 74-80, and 84, satisfy the written description requirements of 35 U.S.C. § 112, first paragraph.

Applicant's claim 1 also requires that the interface card concentrator module communicates packets from at least two of the removable interface cards to the packet forwarding engine. In the Office Action, the Examiner argued that such a limitation is not within Applicant's specification.⁹ On the contrary, however, Applicant's specification states,

In the embodiment shown in FIG. 2, the interface card concentrator 205 includes two packet processing ASICs 210 that process data received through IFCs 206 and assemble outbound packets for sending through IFCs 206. . . . Each packet processing ASIC 210 can process inbound and outbound data for up to four IFCs 206.¹⁰

Moreover, FIG. 2 discloses that the interface card concentrator communicates data to forwarding engine 226.¹¹ FIG. 2 demonstrates an example embodiment wherein interface card concentrator 205 includes two packet processing ASICs 210, and each packet processing ASIC 210 can process data for up to four IFCs 206 (thus eight total in this example). Thus, it is clear that Applicant's specification recites an interface card concentrator module which communicates packets from at least two of the removable interface cards to the packet forwarding engine. Claims 11, 24, 42, 55, and 67 contain a similar requirement and are similarly supported by Applicant's specification, therefore claims 1, 11, 24, 42, 55, and 67 satisfy the written description requirement of 35 U.S.C. § 112, first paragraph.

The Examiner furthermore rejected claims 16 and 47 for the limitation of "midplane communicates to the router module packets received from the network by at least two different

⁹ Office Action page 1, dated March 5, 2007.

¹⁰ Applicant's specification, page 6, lines 11-15.

¹¹ Applicant's specification, page 6, lines 23-30.

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ones of the interface cards." Applicant's FIG. 2 clearly portrays midplane 208 coupled to router 200 and a plurality of interface cards 206. Applicant's specification states, "Network router 200 receives and sends data packets via network links 202 and 204, respectively, using interface cards (IFCs) 206 connected via a passive midplane 208, which also distributes power to IFCs 206."¹² It is clear from the written description that router 200 is coupled to midplane 208, as it would otherwise be impossible for data to reach interface cards 206 from router 200. From the drawings and the written description, it is clear that Applicant's specification describes a midplane coupled to a router module and a plurality of interface cards. As there are a plurality of interface cards in FIG. 2, one skilled in the art would reasonably conclude that the midplane communicates to the router module packets received from the network by at least two different ones of the interface cards. A similar requirement can be found in claim 47, for which similar arguments apply, therefore claims 16 and 47 are patentable for satisfying the written description requirement of 35 U.S.C. § 112, first paragraph.

For at least these reasons, the Examiner has failed to establish a prima facie case for failure to satisfy the written description requirement of 35 U.S.C. § 112, first paragraph of Applicant's specification with respect to claims 1, 2, 4-33, 35-71, and 74-85. Applicant respectfully requests withdrawal of this rejection.

Claim Rejection Under 35 U.S.C. § 112, second paragraph

In the Office Action, the Examiner rejected claims 1, 2, 4-33, 35-71, and 74-85 under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Applicant respectfully traverses this rejection.

In the Office Action, the Examiner stated, "In the independent claims, there are plurality 'removable interface cards' and 'interface cards'; it is unclear whether or not they are the same thing."¹³ Although Applicant respectfully disagrees that the meaning of these elements is unclear, Applicant has amended claims 1, 4, 6, 7, 11, 14, 15, 32, 33, 42, 47, and 55 for purposes of further clarification. Specifically, Applicant has added the descriptor "removable." Applicant

¹² Applicant's specification, page 5, lines 29-31 (emphasis added).

¹³ Office Action page 2, dated March 5, 2007.

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submits that the claims, as amended, particularly point out and distinctly claim the subject matter, as required by 35 U.S.C. § 112, second paragraph. Moreover, although Applicant does not acquiesce as to whether the antecedent basis of the prior version of the claims was proper, by so amending these claims, there is an even stronger demonstration of proper antecedent basis, and the amendments render the rejection for lack of proper antecedent basis moot.

In the Office Action, the Examiner stated, "It is unclear in Claim 83, Lines 16, how the [sic] forward packets back to the interface cards by 'way of the midplane.'" Although Applicant respectfully disagrees that claim 83 is unclear, Applicant has amended claim 83 to clarify that the router module is configured to forward the packets back to the interface cards via the midplane. Applicant's specification describes, in one example embodiment as portrayed in FIG. 2, that, "Network router 200 receives and sends data packets via network links 202 and 204, respectively, using interface cards (IFCs) 206 connected via a passive midplane 208. . . ."¹⁴ Therefore, claim 83 is clear and distinctly points out and claims patentable subject matter.

For at least these reasons, the Examiner has failed to establish a prima facie case for failure to satisfy the written description requirement of 35 U.S.C. § 112, second paragraph of Applicant's claims 1, 2, 4-33, 35-71, and 74-85. Applicant respectfully requests withdrawal of this rejection.

Objection to Drawings

In the Office Action, the Examiner objected to the drawings under 37 C.F.R. § 1.83(a), which states, in relevant portion, "The drawing in a nonprovisional application must show every feature of the invention specified in the claims." Specifically, the Examiner stated that, "the packet forward engine and the interface card concentrator module are integrated into a single unit' must be shown. . . ." Applicant respectfully disagrees that the figures as drawn fail to show a packet forwarding engine and an interface card concentrator integrated into a single unit.

FIG. 2 shows both a packet forwarding engine and an interface card concentrator integrated on a single unit, namely the element labeled router 200. Router 200 includes both interface card concentrator 205 and processor 220, wherein processor 220 performs the functions

¹⁴ Applicant's specification, page 5, lines 29-31 (emphasis added).

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of a packet forwarding engine, as Applicant's specification makes clear. For instance, "A single processor performs various functions in connection with the ASICs, such as . . . the forwarding engine."¹⁵

In the embodiment portrayed in FIG. 2, processor 220 is the "single processor" described above. Applicant's specification further describes the purpose of processor 220 as performing the functions of a forwarding engine.¹⁶ A packet forwarding engine, generally, "performs a lookup in the forwarding table based on the destination address associated with the packet and sends the packet out to the network using the appropriate outgoing interface."¹⁷ Thus it is clear that processor 220 performs the functions of a packet forwarding engine. Therefore, FIG. 2 shows that router 200, i.e. a single unit, includes an interface card concentrator and a packet forwarding engine.

Thus, Applicant's drawings clearly show a single unit including both a packet forwarding engine and an interface card concentrator. Therefore Applicant's drawings satisfy the requirements of 37 C.F.R. § 1.83(a). Applicant respectfully requests withdrawal of this objection.

Claim Rejection Under 35 U.S.C. §§ 102, 103

In the Office Action, the Examiner rejected claims 1, 4-14, 32, 35-42, 44, 45, 63-70, 82, and 84 under 35 U.S.C. § 102(e) as being anticipated by Fan et al. (US 6,643,269, "Fan"). Applicant respectfully traverses the rejection. Fan fails to teach or suggest each and every feature of the claimed invention, as required by 35 U.S.C. § 102(e), and provides no teaching that would have suggested the desirability of modification to include such features. In the Office Action, the Examiner also rejected claims 2, 16-30, 33, 43, 47-61, 71, 74-79, 81, 83, and 85 under 35 U.S.C. § 103(a) as being unpatentable over Fan in view of Wilford et al. (US 6,687,247, "Wilford"). The Examiner further rejected claims 15, 31, 46, 62, and 80 under 35 U.S.C. § 103(a) as being unpatentable over Fan in view of Wilford, and further in view of Zadikian et al. (US 6,724,757, Zadikian). The applied references fail to teach, suggest, or disclose the inventions defined by

¹⁵ Applicant's specification, page 5, lines 7-9.

¹⁶ See Applicant's specification, page 6, line 28-page 7, line 1.

¹⁷ Applicant's specification, page 2, lines 1-3.

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Applicant's claims, and provide no teaching that would have suggested the desirability of modification to arrive at the claimed invention.

As a preliminary matter, Applicant notes that neither Wilford nor Zadikian contain any teachings, suggestions, or disclosures which would overcome the deficiencies of Fan discussed below. In other words, claims dependent on or which share discussed elements of claims 1, 2, 4-33, 35-71, and 74-85 are patentable for at least the reasons discussed below with respect to Fan, where such discussion is applicable to claims 2, 15-31, 33, 43, 46-62, 71, 74-81, 83, and 85.

Independent Claims 1, 16, 32, 63, 71, and 81-85

Claim 1, for example, requires a router module comprising a packet forwarding engine and an interface card concentrator module. Claim 1 also requires that the forwarding engine performs route lookups for packets received from at least two removable interface cards and selects routes for the packets and forwards the packets back to the plurality of removable interface cards. In the Office Action, the Examiner referred to FIG. 6 and asserted that the packet processor of Fan is a packet forwarding engine.

However, FIG. 6 of Fan illustrates packet processors coupled to individual interface cards. Fan does not provide any teaching with respect to an interface concentrator and a forwarding engine that performs route lookups for the packets received from the at least two removable interface cards, as required by claim 1. Specifically, FIG. 6 of Fan shows a one-to-one correspondence between the packet processor 54 and media access controller (MAC) 56. The written description of Fan states that the packet processor is coupled to a media access controller to receive packets.¹⁸ Fan describes the MACs as "well known."¹⁹ A standard, well known MAC provides a physical interface for a single network port according to the known art. Fan provides no written description teaching a packet forwarding engine and an interface card concentrator module, wherein the interface card concentrator couples the packet forwarding engine to the plurality of removable interface cards.

The limitations of Fan's teachings are clearly illustrated in FIG. 6 of Fan, which shows that a plurality of different packet processors would connect to the switching fabric 50 (see

¹⁸ Fan FIG. 6 and col. 8, ll. 43-54.

¹⁹ Fan col. 8, l. 50.

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ellipses associated with inputs to fabric 50). Accordingly, the device illustrated in FIG. 6 of Fan requires a plurality of packet processors to service different network interfaces, as specifically shown in FIG. 6, and not a single packet processor capable of servicing packets from different interfaces let alone different removable interface cards. In this manner, Fan is similar to Wilford, as addressed at great length by the Applicant's previous responses.

In contrast, Applicant's claim 1 requires a centralized forwarding engine that performs route lookups for the packets received from the at least two removable interface cards and selects routes for the packets and forwards the packets back to the plurality of removable interface cards. Instead, as Fan makes clear, the interface cards of Fan perform standard routing functions.²⁰ Although discussed primarily with respect to claim 1, similar arguments may apply to independent claims 16, 32, 63, 71, and 81–85, as each of these claims comprise requirements similar to a forwarding engine.

Claim 1 also requires an interface card concentrator which couples the packet forwarding engine to the plurality of removable interface cards and that the packet forwarding engine forwards the packets back to the plurality of removable interface cards via the interface card concentrator module. Furthermore, claim 1 requires that the interface card concentrator module communicates packets from at least two of the removable interface cards to the packet forwarding engine.

In the Office Action, the Examiner argued that the packet processor of Fan is an interface card concentrator. FIG. 6 of Fan clearly demonstrates, however, that a packet processor, e.g. packet processor 48, is not a router module comprising both an interface card concentrator and a packet forwarding engine, as required by Applicant's claim 1. As discussed above, FIG. 6 shows each interface card of Fan coupled to an individual packet processor, and that multiple packet processors would be required. The only functionality described by Fan with respect to the packet processor 54 is that of forwarding packets received from MAC 55. Specifically, Fan states that packet processor 54 analyzes the header of a received packet and sends received packets a switching fabric to a proper destination.²¹ Fan fails to describe packet processor as performing any functions as Applicant's recited interface card concentrator. To the extent packet processor

²⁰ Fan col. 10, ll. 11–14.

²¹ Fan col. 9, ll. 6–19.

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54 could even be associated with different interface cards, FAN provides no description as to how this could be accomplished and what additional components would be required. Fan, certainly provides no suggestion that the packet processor performs any such function. Therefore, it is clear that Fan fails to provide any teaching with respect to an interface card concentrator module required by Applicant's claim 1. Similar arguments apply to claims 32, 63, and 71 each of which comprise requirements similar to an interface card concentrator.

Claim 1 furthermore requires that the packet forwarding engine and the interface card concentrator module are integrated into a single unit. As discussed above, Fan fails to teach or suggest an interface card concentrator and a packet forwarding engine. Moreover, Fan fails to teach or suggest an interface card concentrator and a packet forwarding engine integrated into a single unit. Claim 1 requires an interface card concentrator that communicates packets from at least two of the removable interface cards to the packet forwarding engine. Fan discloses absolutely no means by which to communicate packets from at least two interface cards to a packet forwarding engine which is integrated into a single unit with a packet forwarding engine. The only apparent means by which Fan might communicate packets might be logic provided by the backplane of FIG. 6. However, the backplane is not integrated into a single unit with the forwarding logic; indeed, FIG. 6 clearly portrays the backplane as being separate and distinct from the forwarding logic. Claims 16, 32, 47, 71, and 81-85 each comprise similar requirements for which similar arguments may be made.

Claims 84 and 85 each require a switch arrangement coupled to the plurality of routing devices and configured to switch control from a first routing device to a second routing device. In the Office Action, the Examiner cited Fan col. 8, ll. 30-35 as disclosing such a switch arrangement. This cited portion states:

By utilizing a 10-bit word with a balanced number of 1's and 0's on the backplane, the baseline wander is greatly reduced, thus enabling better AC coupling of the cards to the backplane.

When the SERDES 42 is receiving serial 10-bit data from the ring interface card 32, the SERDES 42 is able to detect whether there is an error in the 10-bit word if the word does not match one of the words in the table.

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Clearly this cited portion makes no mention of a switch arrangement as required by Applicant's claims 84 and 85. Fan makes reference to a switching fabric which enables packet transfer between packet processors. Fan also makes reference to packet switched networks, but these are very different from a switch arrangement required by Applicant's claims 84 and 85. However, Fan fails to teach or discuss anything remotely resembling a switch configured to switch control from a first routing device to a second routing device.

Dependent Claims 2, 4-15, 17-31, 33, 35-62, 64-70, and 74-80

The claims dependent on independent claims 1, 16, 32, 63, 71, and 81-85, namely claims 2, 4-15, 17-31, 33, 35-62, 64-70, and 74-80, incorporate all of the limitations of the respective base claims, and therefore are patentable for at least the reasons expressed above. Moreover, the dependent claims recite a number of additional features that are likewise not taught or suggested by Fan, even in view of Wilford or in further view of Zadikian.

For example, claim 9 requires a memory management circuit configured to provide a notification to the packet forwarding engine based on information extracted from an incoming data packet. Claims 22, 40, 53, 65, and 77 each comprise similar requirements. In the Office Action, the Examiner cited FIG. 6 of Fan as teaching such a memory management circuit. However, neither FIG. 6 nor the accompanying written description, i.e. Fan col. 8, l. 5 to col. 11, l. 7, makes any mention of a memory management circuit configured to provide a notification to the packet forwarding engine based on information extracted from an incoming data packet. Likewise, the flowcharts of Fan (i.e. FIGS. 2-4) and accompanying written description lack any mention of a notification. Rather than providing a notification, the device of Fan simply acts upon a received packet in accordance with the known art.

Fan fails to teach, suggest, or disclose each and every limitation set forth in claims 1, 4-14, 32, 35-42, 44, 45, 63-70, 82, and 84. For at least these reasons, the Examiner has failed to establish a prima facie case for anticipation of Applicant's claims 1, 4-14, 32, 35-42, 44, 45, 63-70, 82, and 84 under 35 U.S.C. § 102(e). Moreover Fan in view of Wilford and in further view of Zadikian fails to teach, suggest, or disclose each and every limitation set forth in claims 2, 15-31, 33, 43, 46-62, 71, 74-81, 83, and 85. For at least these reasons, the Examiner has failed to establish a prima facie case for non-patentability of Applicant's claims 2, 15-31, 33, 43, 46-62,

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71, 74-81, 83, and 85 under 35 U.S.C. § 103(a). Applicant respectfully requests withdrawal of these rejections.

CONCLUSION


All claims in this application are in condition for allowance. Applicant respectfully requests reconsideration and prompt allowance of all pending claims. Please charge any additional fees or credit any overpayment to deposit account number 50-1778. The Examiner is invited to telephone the below-signed attorney to discuss this application.

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By:

June 5, 2007

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